

Appl. No.: 10/790,535
Docket No.: 020732-107.692

Section II. (REMARKS)

The pending claims in the application are 1-16, 18, 20-41, 43, and 45-63.

Allowable Subject Matter

In the November 16, 2006 Office Action, the Examiner indicated that claim 57 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants acknowledge same.

Claim Objections and Amendment to the Claims

Claims 11, 12, 37, 38 and 50 have been amended consistent with the Examiner's suggestions in the November 16, 2006 Office Action.

Support for the amendment to claim 55 can be found in the instant disclosure at paragraphs [0046] and [0047].

No new matter has been added herein.

Rejection of Claims and Traversal Thereof

In the November 16, 2005 Office Action:

claims 1-16, 18, 20-41, 43, 45-54 and 60-63 were rejected under 35 U.S.C. §112, first paragraph;

claims 4, 30, 34, and 45 were rejected under 35 U.S.C. §112, second paragraph;

claim 55 was rejected under 35 U.S.C. §102(e) as being anticipated by DeYoung et al. (U.S. Patent No. 6,669,785);

claims 56, 58 and 59 were rejected under 35 U.S.C. §103(a) as being unpatentable over Mullee et

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al. (U.S. Patent No. 6,500,605) in view of Hayasaki et al. (U.S. Patent No. 7,018,481); and

claims 62-63 were rejected under 35 U.S.C. §103(a) as being unpatentable over Reid et al. (U.S. Patent No. 6,958,123).

These rejections are traversed and reconsideration of the patentability of the pending claims is requested in light of the following remarks.

Rejection under 35 U.S.C. §112, first paragraph

In the November 16, 2006 Office Action, claims 1-16, 18, 20-41, 43, 45-54 and 60-63 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner stated that the recital of "polymer species" in each of claims 1, 25 and 62 was not supported in the specification and is therefore considered new matter. Applicants vigorously disagree.

The Examiner is respectfully reminded that to satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention at the time of filing. MPEP §2163 (I) (citing *Vas-Cath, Inc. v. Mahurkar*, 19 U.S.P.Q.2d 1111, 1116 (Fed. Cir. 1991)). Furthermore, each claim must be given its broadest reasonable interpretation in light of and consistent with the written description. MPEP §2163 (II)(A)(1) (citing, e.g., *In re Morris*, 44 U.S.P.Q.2d 1023, 1027 (Fed. Cir. 1997)).

Turning to the present case, the specification recites:

"'Binders' are defined herein as species that interact with the silicon-containing particulate material to enhance removal from the semiconductor wafer. [] The binder of the present invention may be derived from at least one ethylenically unsaturated reactant. In a preferred embodiment, the binder is a polymeric alcohol, a polymeric amine, a polymeric acetate or a enzymatically decomposed sugar." (See, instant specification, paragraph [0031]) (emphasis added)

It can be seen that the binders are described as species that may be derived from at least one ethylenically unsaturated reactant. In other words, contrary to the Examiner's contention, there is

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support for the term "polymeric species" in the application as filed. Moreover, the Examiner is respectfully reminded that the subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement. MPEP §2163.02. In the present case, one skilled in the art would reasonably conclude that the inventor had possession of the claimed invention at the time of filing.

Withdrawal of the rejection of claims 1-16, 18, 20-41, 43, 45-54 and 60-63 under 35 U.S.C. §112, first paragraph, is respectfully requested.

Rejection under 35 U.S.C. §112, second paragraph

In the November 16, 2006 Office Action, claims 4, 30, 34 and 45 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4, 30 and 34 have been amended consistent with the Examiner's suggestions in the November 16, 2006 Office Action and claim 45 was amended to depend from claim 41, thereby obviating these rejections.

Withdrawal of the rejection of claims 4, 30, 34 and 45 under §112, second paragraph, is respectfully requested.

Rejections under 35 U.S.C. §102

1. In the November 16, 2006 Office Action, claim 55 were rejected under 35 U.S.C. §102(e) as being anticipated by DeYoung et al. (U.S. Patent No. 6,669,785) (hereinafter DeYoung). Applicants traverse such rejection.

Applicants have amended claim 55 to recite:

"A composition comprising about 85.0% to about 99.0% SCCO_2 , about 0.01% to about 15.0% N-methylpyrrolidone (NMP), about 0.1% to about 5.0% triethylamine trihydrofluoride, and up to about 3.0% dioctyl sodium sulfosuccinate, based on the total weight of the composition, wherein said composition is useful for removing silicon-

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containing particulate material from the surface of a semiconductor wafer.” (emphasis showing amendment(s) made herein)

DeYoung does not teach or suggest the use of NMP as the co-solvent or dioctyl sodium sulfosuccinate as the surfactant. Accordingly, DeYoung does not anticipate applicants' claim 55 because it does not teach, expressly or inherently, each and every element as set forth in said claim.¹

In conclusion, DeYoung does not anticipate applicants' claim 55. Withdrawal of the rejection of claim 55 under §102 in view of DeYoung is respectfully requested.

Rejections under 35 U.S.C. §103

1. In the November 16, 2006 Office Action, claims 56, 58 and 59 were rejected under 35 U.S.C. §103(a) as being unpatentable over Mullee et al. (U.S. Patent No. 6,500,605) (hereinafter Mullee '605) in view of Hayasaki et al. (U.S. Patent No. 7,018,481) (hereinafter Hayasaki). Applicants traverse such rejection.

Mullee '605 relates to a method of removing photoresist and residue from a substrate using a supercritical fluid-containing composition. Typically the photoresist and/or residue to be removed is present on the substrate following a preceding semiconductor processing step such as ion implantation or etching (see, Mullee '605, col. 4, lines 31-34).

In contrast, Hayasaki relates to the actual development of photoresist, including a method of developing a photosensitive resist film in which a desired pattern is exposed.

According to the Examiner:

“Mullee '605, however, fails to disclose a pre-cleaning step comprising a SCF based pre-cleaning composition and an aqueous-based pre-cleaning composition comprising an oxidizing agent.

Hayasaki teaches, in an analogous art, a pretreatment method comprising an ozone water Hayashi [sic] also teaches a

¹ *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987).

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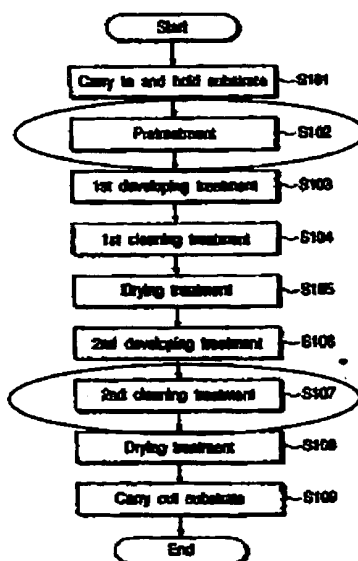
cleaning treatment comprising any cleaning solution such as a reducing solution, oxidizing solution (ozone water, oxygen water), weak alkali ion water, slightly acidic ion water, supercritical water, carbonated water, hydrogen water, and pure water, and combinations of these solution [sic] so that the cleaning effect is raised (see col. 26, lines 55-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to pretreat the wafers of Mullee '605 with the ozone water of Hayashi [sic] in combination with supercritical water because this would raise the cleaning effect as taught by Hayasaki."

Applicants vigorously disagree.

Firstly, Hayasaki teaches a pretreatment step whereby ozone water is discharged onto a substrate "so as to uniformly form the solution film on the substrate" (see, Hayasaki, col. 25, lines 21-35). In other words, the pretreatment step of Hayasaki, which relates to the formation of a film on a substrate, is mutually exclusive of applicants' pre-cleaning process, whereby materials are removed from the surface.

Secondly, in addition to the ozone water, other "pretreatment" components are listed in Hayasaki including oxygen water, hydrogen water, nitric acid, oxygenated water, and alkali ion water – but not supercritical water (see, Hayasaki, col. 25, lines 21-35). Interestingly, the Examiner referred to a later disclosure in the Hayasaki reference, relating to a second cleaning treatment, to find any teaching relating to the use of supercritical water. Referring to Fig. 11 of Hayasaki, as reproduced herein for ease of reference, the pretreatment step and the second cleaning treatment do not in any way correspond to the same step.



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In short, the Examiner has incorporated two different teachings in the same reference relating to two different compositions/steps, i.e., the second cleaning solution and the pretreatment solution, into one "pretreatment" composition. This is not legally permissible without a motivation, teaching or suggestion to do so, which there is not.

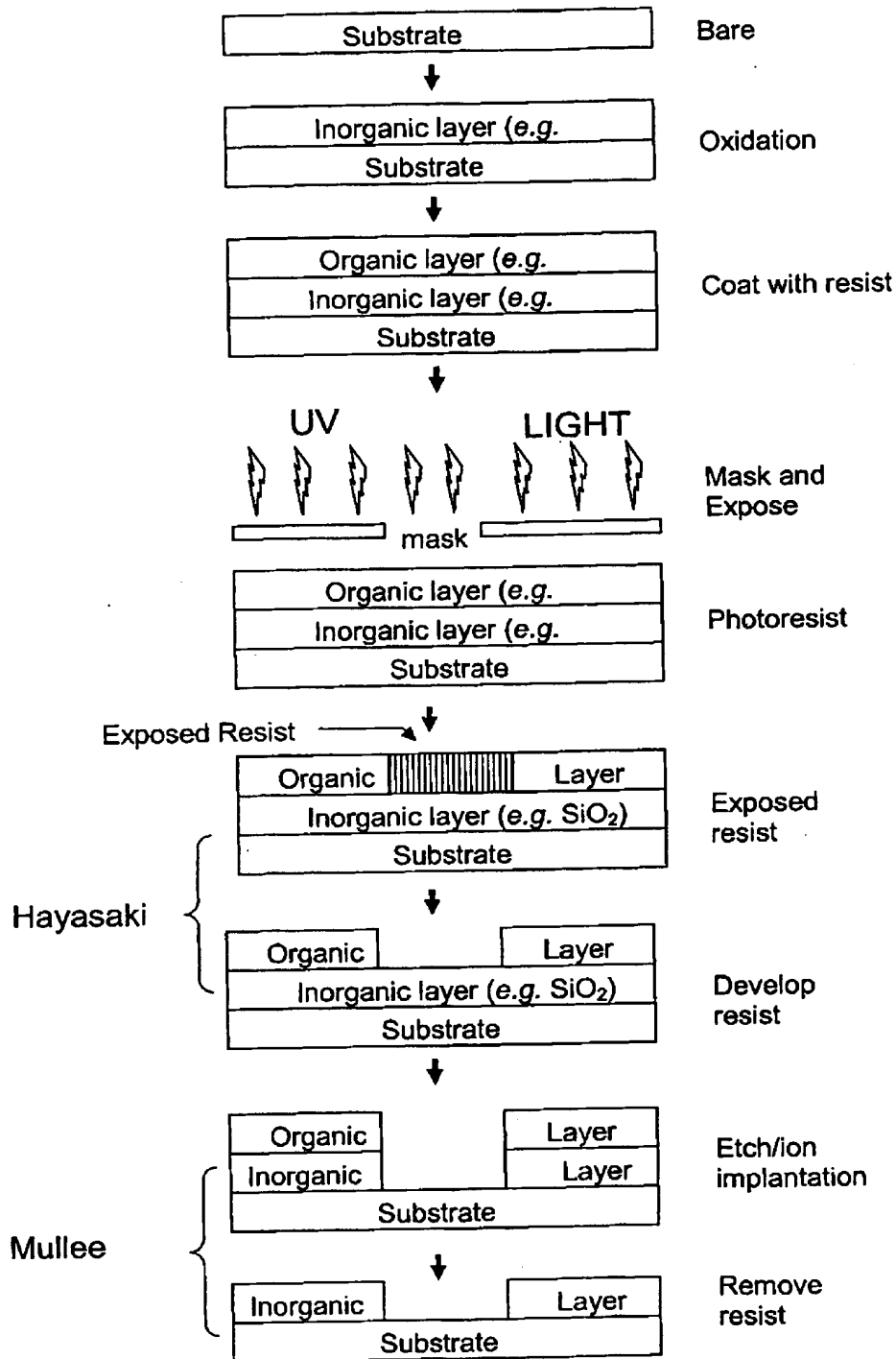
The foregoing compels the conclusion that the rejection is based solely on hindsight, which is impermissible. The courts have made it clear that Examiner's must not use the applicant's own disclosure as a blueprint to arbitrarily piece together isolated features described in the references (where no teaching or suggestion to combine the references is present) in an attempt to re-create applicants' claimed invention.

Thirdly, even if there were some objective motivation, teaching or suggestion to combine Mullee '605 with Hayasaki, which there is not, Hayasaki would be rendered unsatisfactory for its intended purpose. As such, a *prima facie* case of obviousness does not exist. See *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Importantly, the Examiner is not allowed to cherry pick the disclosures of Hayasaki and Mullee '605 in an attempt to re-create applicants' claimed invention. Anything else would amount to hindsight reconstruction, which the courts have made clear is improper.

The intended purpose of Hayasaki is a method for developing a photosensitive resist film in which a desired pattern is exposed (see, the illustration on the next page). In other words, in Hayasaki, photoresist in the shape of the photolithographic mask must remain on the substrate following development for subsequent processes, i.e., etching, ion implantation, etc. Mullee '605 relates, in part, to a method of stripping ion implanted, i.e., hardened, photoresist from the surface of semiconductor substrate using supercritical CO₂ and other inorganic or organic solvents (see, the illustration on the next page). It is well known in the art that a formulation that will remove hardened photoresist will easily remove non-hardened photoresist.

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If one were to combine the teachings of Mullee '605 and Hayasaki, as suggested by the Examiner, the net teaching would be a composition that will remove photoresist, regardless of whether it is post-development photoresist, post-etch photoresist or post-ion implantation photoresist. Clearly, in the case of Hayasaki, this combination would destroy the very pattern that was created during the photolithography process, defeating the purpose of photolithography.

In conclusion, since there is no motivation, teaching or suggestion to combine Mullee '605 and Hayasaki and because Hayasaki would be rendered unsatisfactory for its intended purpose, applicants request withdrawal of the objection of claims 56, 58 and 59 under 35 U.S.C. §103(a) over Mullee '605 in view of Hayasaki.

2. In the November 16, 2006 Office Action, claims 62-63 were rejected under 35 U.S.C. §103(a) as being unpatentable over Reid et al. (U.S. Patent No. 6,958,123) (hereinafter Reid). Applicants traverse such rejection.

According to the Examiner:

"Reid teaches a composition comprising a supercritical fluid, such as carbon dioxide, along with a co-solvent and dissolves a polymer and deposits the dissolved polymer on a substrate as a sacrificial layer . . . wherein one selection of polymer is polyvinyls Silinon [sic] nitride is also present in the substrate (see claim 26). Reid however, fails to specifically disclose a composition wherein the polymer is polyvinyls.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected polyvinyls as the specific polymer in the composition of Reid because this is one useful selection of polymers taught by Reid."

Applicants vigorously disagree.

The Examiner is respectfully reminded that prior art references must be considered as a whole.² In the present case, respectfully, the Examiner has not considered Reid as a whole and has instead taken it out of context in an attempt to establish a *prima facie* case of obviousness.

² *W.L. Gore & Associates, Inc., v. Garlock, Inc.*, 220 U.S.P.Q. 303 (Fed. Cir. 1993), *cert. denied*, 469 U.S. 851 (1984)

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Reid relates to a method of removing (and depositing) a sacrificial material with a compressed fluid. The simplest way to describe the teaching of Reid is to refer to claim 1, which recites:

"1. A method comprising:

depositing an organic material on a substrate;

depositing additional material different from said organic material after depositing the organic material; and

removing the organic material with a compressed fluid;

wherein the released and movable additional material forms a micromirror for a display system or optical switch." (emphasis added)

The organic material includes polymers such as "alkyd, acrylic, epoxy, polyxylylene, polyvinyl, polyurethane, fluorocarbon, phenolic, polyimide or silicone" (see, claims 4 and 5). The additional material may include a silicon nitride layer (see, claims 25 and 26).

Referring to claim 1 of Reid, it is only the organic material that is removed with the compressed fluid, not the silicon nitride, i.e., additional material, that the Examiner contends in the November 16, 2006 Office Action.

Even knowing that Reid discloses that the organic material may be deposited or removed with a compressed fluid, Reid teaches that only one type of organic material may be used at a time, as indicated by the use of "or" in claim 5 ("alkyd, acrylic, epoxy, polyxylylene, polyvinyl, polyurethane, fluorocarbon, phenolic, polyimide or silicone"). In other words, Reid does not motivate teach or suggest a composition comprising a SCF, silicon-containing particulate material, and a polymeric species selected from the group consisting of polymeric alcohol and polymeric amine, as claimed by applicants herein.

Accordingly, Reid does not motivate, teach or suggest each and every limitation of applicants' claims 62 and 63 and as such, a *prima facie* case of obviousness was not established. Withdrawal of the rejection of claims 62 and 63 under §103 in view of Reid is respectfully requested.

Conclusion

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Claims 1-16, 18, 20-41, 43, and 45-63 are now in form and condition for allowance. Favorable action is hereby requested. Authorization is hereby given to charge any deficiency in applicable fees for this response to Deposit Account No. 13-4365 of Moore & Van Allen PLLC. If any additional issues remain, the Examiner is requested to contact the undersigned attorney at (919) 286-8090 to discuss same.

Respectfully submitted,
MOORE & VAN ALLEN PLLC

Date: Feb. 13, 2007

By: _____



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